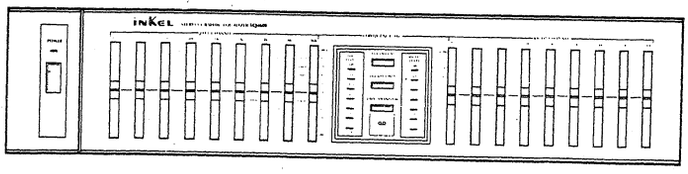
SERVICE MANUAL

EQ460

Graphic Equalizer



Specifications

Semiconductors
ICs 5
Transistors 21
Diodes 7
L.E.D. 34
Equalizer Section
Equalizer Range
(Individual channel adjust) ..... ±12dB
63Hz, 125Hz, 250Hz, 500Hz, 1KHz, 2KHz, 4KHz, 8KHz, 16KHz
Total Harmonic Distortion
20Hz—20KHz, All Control; Flat, Output: 1V 0.025%
1KHz, All Control; Max., Output: 3V 0.06%
1KHz, All Control; Flat, Output: 2V 0.005%
1KHz, All Control; Min., Output: 0.2V 0.1%
Insertion Loss ..... 0dB(Control, Flat)
Max. Output Voltage
(1KHz, THD. 0.5%, RL47KΩ) 7.5V
Frequency Response ..... 10Hz—50KHz +0—3dB
Signal to Noise Ratio
(IHF, A Network, short circuited, 1V Output) ... 95dB
Input Impedance 50KΩ
Output Impedance 600Ω
Miscellaneous
Power Consumption 7.5W
Dimensions ..... 440(W)×95(H)×200(D)mm
Weight(without package) .. 3.4Kg
Furnished Parts
Connection Cord with Pin Plugs 2
Operating Instructions 1

NOTE:
Specification and the design subject to possible modification without notice due to improvements.

Sherwood

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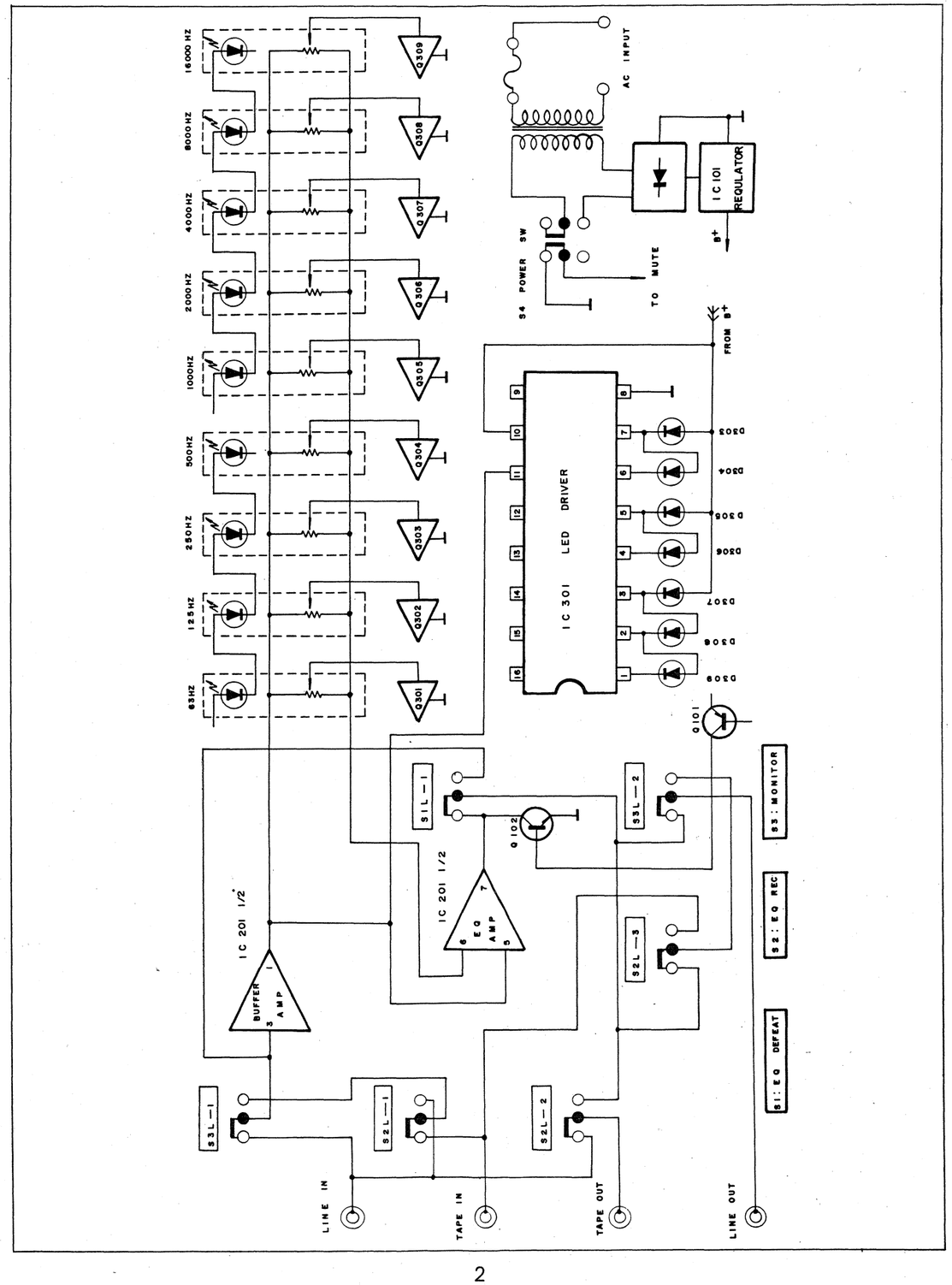
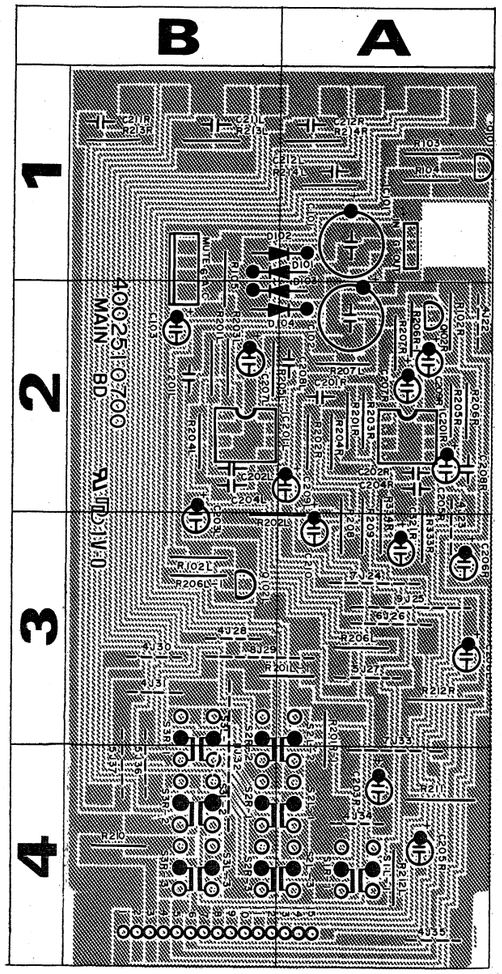
Block Diagram



Parts List & Top View of P.C Boards

MAIN BOARD 4002510700

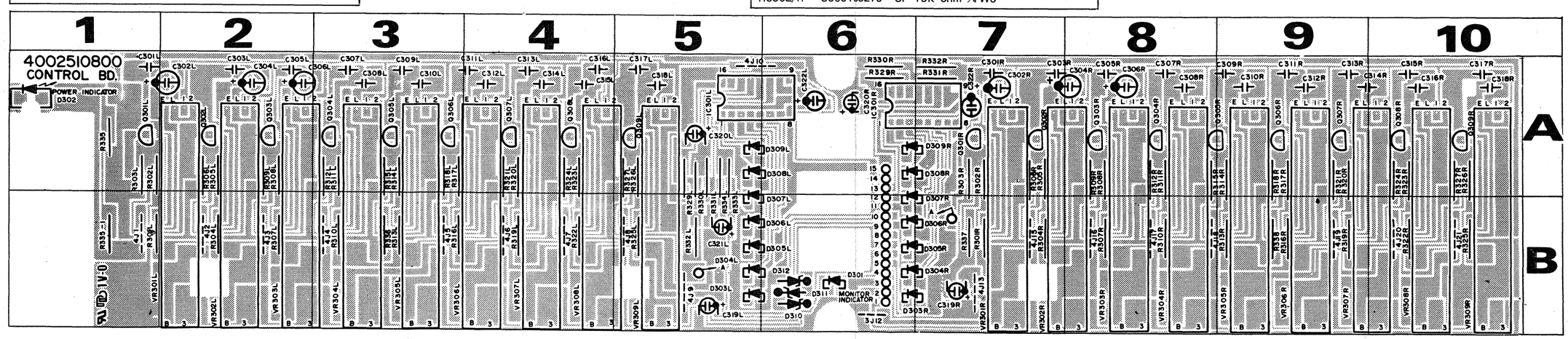
Ref.No.	Parts No.	Description	Position
●IC			
IC101	2168611100	HA 17824 SGS	1A
IC201L/R	2168220103	NJM 4560D JRC	2A/2B
●TRANSISTOR			
Q101	2008206105	PNP KTA1015-Y KEC	1A
Q102L/R	2008610102	NPN 2SD1302S MATSU	3B/2A
●DIODE			
D101,102	2058106100	RECTIFIER 1N4002	1A,1B
D103,104			2A,2B
●RESISTER			
R105	3609100270	CF 10 ohm ¼WJ	
R207L/R	3609101270	CF 100 ohm ¼WJ	
R201L/R	3609102270	CF 1K ohm ¼WJ	
R203L/R	〃	〃	
R206L/R	〃	〃	
R212L/R	〃	〃	
R213L/R	〃	〃	
R214L/R	〃	〃	
R210	3609222270	CF 2.2K ohm ¼WJ	
R102L/R	3609332270	CF 3.3K ohm ¼WJ	
R211	3609472270	CF 4.7K ohm ¼WJ	
R208	3609512270	CF 5.1K ohm ¼WJ	
R209	3609103270	CF 10K ohm ¼WJ	
R204L/R	3609183270	CF 18K ohm ¼WJ	
R205L/R	〃	〃	
R104	3609223270	CF 22K ohm ¼WJ	
R333R	3609513270	CF 51K ohm ¼WJ	
R103	3069823270	CF 82K ohm ¼WJ	
R201L/R	3069104270	CF 100K ohm ¼WJ	
R202L/R	〃	〃	
R206L/R	〃	〃	
R334R	3069184270	CF 180K ohm ¼WJ	
●CAPACITOR			
C208L/R	3509121130	Ceramic 120PF 50VJ	
C202L/R	3509221130	Ceramic 220PF 50VJ	
C204L/R	〃	〃	
C201L/R	3509471130	Ceramic 470PF 50VJ	
C211L/R	3509102530	Ceramic 0.001μF 50VJ	
C212L/R	〃	〃	
C203L/R	3409210971	Elect AF SA 1μF 50V	
C209L/R	〃	〃	
C321R	〃	〃	
C103	3409210061	Elect AF SA 10μF 35V	
C202L/R	〃	〃	
C206L/R	〃	〃	
C210	〃	〃	
C207L/R	3409247041	Elect AF SA 47μF 25V	
C102	3409247141	Elect AF SA 470μF 25V	
C101	3409247161	Elect AF SA 470μF 35V	



CONTROL BOARD 40025100800

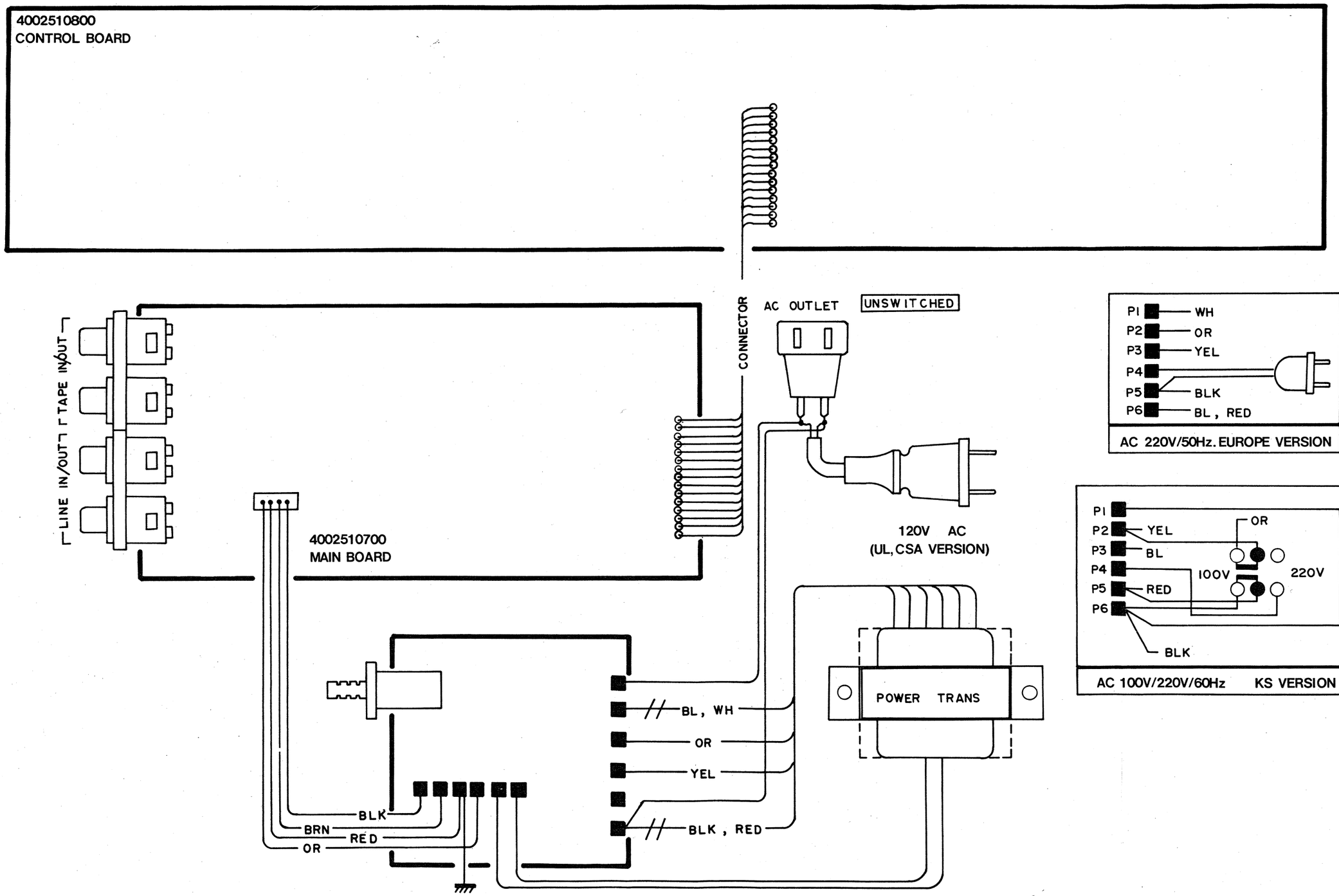
Ref. No.	Parts No.	Description	Position
●IC			
IC301L/R	2168010197	AN6882 MATSU	5A/7A
●TRANSISTOR			
Q301L/R	2008606109	NPN KTC 3199-Y KEC	1A/7A
Q302L/R	〃	〃	2A/7A
Q303L/R	〃	〃	2A/8A
Q304L/R	〃	〃	3A/8A
Q305L/R	〃	〃	3A/9A
Q306L/R	〃	〃	3A/9A
Q307L/R	〃	〃	4A/9A
Q308L/R	〃	〃	4A/10A
Q309L/R	〃	〃	5A/10A
●DIODE			
D310,311	2058513100	ZENER RD3.3E B1 NEC	6B
D312	〃	〃	
D302	2308220111	LED SLB 15μR3RD-ROHM	1A
D301	2308220109	LED SLR 54μRC3-RD ROHM	6B
D303L/R	〃	〃	5B/7B
D304L/R	〃	〃	5B/7B
Q305L/R	〃	〃	5B/7B
D306L/R	〃	〃	5B/7B
D307L/R	〃	〃	5B/7B
D308L/R	〃	〃	5A/7A
D309L/R	〃	〃	5A/7A
●RESISTOR			
R335-1	3609331270	CF 330 ohm¼WJ	
R335,336	3609821270	CF 820 ohm ¼WJ	
R337	〃	〃	
R314L/R	3609102270	CF 1K ohm ¼WJ	
R338	〃	〃	
R305L/R	3609122270	CF 1.2K ohm ¼WJ	
R308L/R	〃	〃	
R311L/R	〃	〃	
R317L/R	〃	〃	
R320L/R	〃	〃	
R323L/R	〃	〃	
R326L/R	〃	〃	
R302L/R	3609152270	CF 1.5K ohm ¼WJ	
R329L/R	3609682270	CF 6.8K ohm ¼WJ	
R303L/R	3609103270	CF 10K ohm ¼WJ	
R306L/R	〃	〃	
R309L/R	〃	〃	
R312L/R	〃	〃	
R315L/R	〃	〃	
R318L/R	〃	〃	
R321L/R	〃	〃	
R324L/R	〃	〃	
R327L/R	〃	〃	
R332L/R	3609153270	CF 15K ohm ¼WJ	
R330L/R	3609183270	CF 18K ohm ¼WJ	

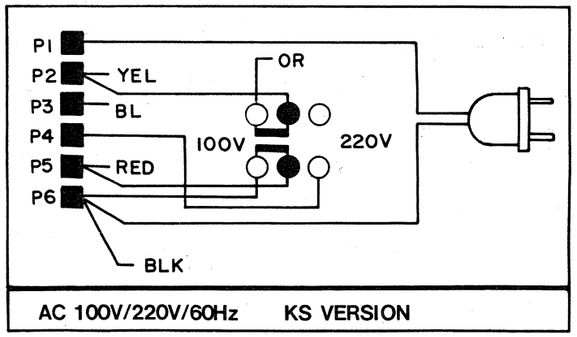
Ref. No.	Parts No.	Description	Position
R333L	3609513270	CF 51K ohm ¼WJ	
R301L/R	3609104270	CF 100K ohm ¼WJ	
R304L/R	〃	〃	
R307L/R	〃	〃	
R310L/R	〃	〃	
R313L/R	〃	〃	
R316L/R	〃	〃	
R319L/R	〃	〃	
R322L/R	〃	〃	
R325L/R	〃	〃	
R331L/R	〃	〃	
R334L	3609184270	CF 180K ohm ¼WJ	
●CAPAC TOR			
C317L/R	3509251130	Ceramic 250PF 50V J	
C315L/R	3509391130	Ceramic 390PF 50V J	
C313L/R	3509821130	Ceramic 820pF 50VJ	
C306L/R	3409222871	Elect AF SA 0.22μF 50V	
C304L/R	3409247871	Elect AF SA 0.47μF 50V	
C302L/R	3499210971	Elect AF SA 1μF 50V	
C321L	〃	〃	
C319L/R	3409210061	Elect AF SA 10μF 35V	
R320L/R	〃	〃	
C322L/R	3409222031	Elect AF SA 22μF 16V	
C311L/R	3609182120	Mylkr 0.0018μF 100VJ	
C309L/R	3609332120	Mylar 0.0033μF 100VJ	
C318L/R	3609392120	Mylar 0.0039μF 100VJ	
C307L/R	3609822120	Mylar 0.0082μF 100VJ	
C316L/R	〃	〃	
C305L/R	3609153120	Mylar 0.015μF 100VJ	
C314L/R	〃	〃	
C303L/R	3609333120	Mylar 0.033μF 100VJ	
C312L/R	〃	〃	
C301L/R	3609683120	Mylar 0.068μF 100VJ	
C310L/R	〃	〃	
C308L/R	3609104120	Mylar 0.1μF 100VJ	



3 4

Point to Point Wiring Diagram



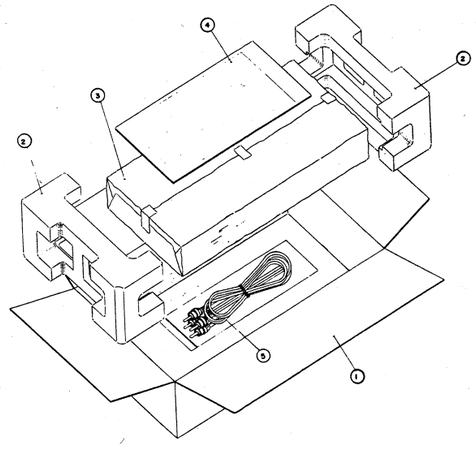


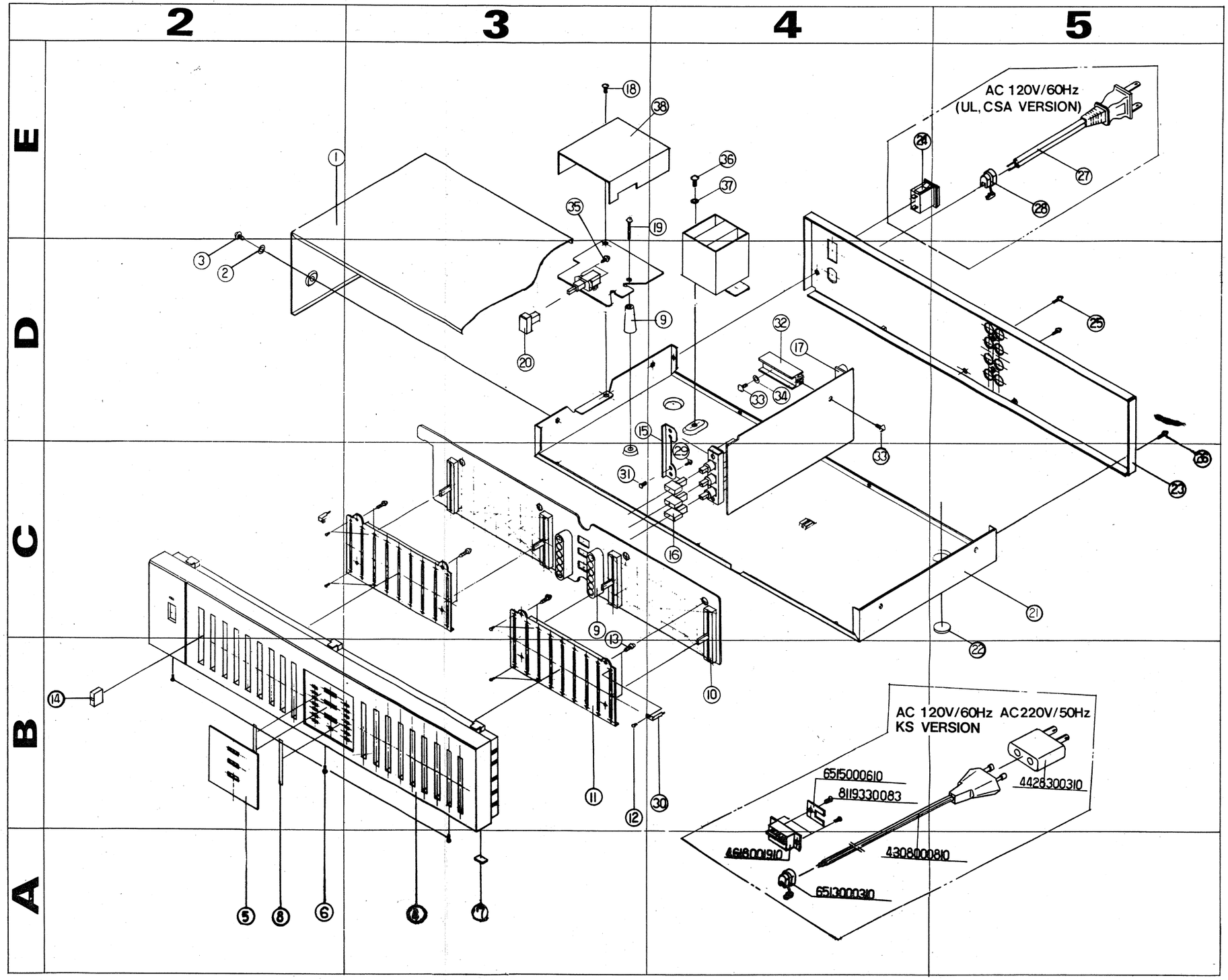
Parts List & Exploded View of Cabinet & Chassis

No.	Parts No.	Description	Position
1	046122008522	COVER TOP	E2
2	8305000510	WASHER VINYL	D2
3	8159440083	SCREW WSAM 4×8(B)	D2
4	048501002812	PANEL FRONT	A3
5	048555008512	WINDOW L.E.D	A2
6	8109330081	SCREW #3 BTC 3×8Y	A2
7	6725000810	CUSHION FOOT	A3
8	1858400201	TAPE W/ADSV 3M6B	A2
9	6705004710	HOLDER L.E.D	D4
10	3238010410	SLVR 45L 50KW×1	B4
11	6503007110	SKT EQ	B3
12	8019120041	SCREW PM 2×4Y	B3
13	8119130081	SCREW #1 PT 3×8Y	C3
14	048543003912	KNOB SLIDE	B2
15	6505058410	BKT PUSH S/W(3KEY)	D3
16	048545020412	BUTTON PUSH S/W(FUNCE)	C4
17	4438100410	JACK R.C.A(4P)	D4
18	8159230061	SCREW #2 WPTC 3×6Y	E3
19	8159240301	SCREW #2 WPTC 4×30Y	E4
20	048543003212	BUTTON PUSH(POWER)	D3
21	6122610610	CHASSIS MAIN	C5
22	6725000910	CUSHION FOOT	B5
23	046102015511	CHASSIS BACK	C5
24	4448100210	OUTLET AC	E4
25	8119130083	SCREW #1 PT 3×8(B)	D5
26	8119330083	SCREW #3 PTC 3×8(B)	C5
27	4308001410	CORD AC POWER	E5
28	6518000710	STOPPER CORD AC	E5
29	8119130081	SCREW #1 PT 3×8Y	C4
30	4235003710	TERMINAL G.N.D	B4
31	8019130061	SCREW #PM 3×6Y	C3
32	7505201940	H/SINK REG TR	D4
33	8109230081	SCREW #2 BTC 3×8 Y	C4
34	8319130011	WASHER SPRING ϕ3(Y)	D4
35	8119130081	SCREW #1 PT 3×8Y	E3
36	8159440081	SCREW WSAM 4×8(Y)	E4
37	8319140011	WASHER SPRING ϕ4(Y)	E4
38	4835006210	COVER FUSE	E4

Packing

NO.	PARTS NO.	DESCRIPTION	Q'TY
1	9605060100	BOX CARTON	1
2	9722009110	CUSHION POLY	2
3	9715000110	FILM SOFT PE	1
4	9007010670	OPERATING INSTRUCTIONS	1
5	4328200510	CORD RCA	1





A B C D

1 2 3 4 5

Schematic Diagr

FOR FTZ

EQ DEFEAT — S1L-1

EQ REC — S2L-1, S2L-2, S2L-3

MONITOR — S3L-1, S3L-2, S3L-3

C211L 1000P

R213L 1K

IN

LINE

OUT

IN

TAPE

OUT

R214L 1K

C212L 1000P

R210 2.2K

MONITOR INDICATOR

C319L 10/50

D301

R201L-1 100K

IC201L

C203L 1/50

R203L 1K

R204L 15K

C201L 470P

R201L 1K

C202L 220P

C204L 220P

R202L 100K

R205L 15K

C208 120P

R206L 1K

C209L 1/50

R206L-1 100K

Q102L

R212L 1K

R102L 3.3K

C207L 47/25

R207 100

C205L 10/50

C206L 10/50

R209 10K

R211 4.7K

C210 10/50

R208 5.1K

R334R 180K

C321R 1/50

R333R 51K

R201L-1 100K

S2R-1, S2R-2, S2R-3

S3R-1, S3R-2, S3L-3

S1R-1

Q101

R103 82K

R104 22K

R105 10

C103 10/50

OUT 15V

IC101

C102 470/25

IN

C101 470/35

D102, D104, D101, D103

D310, D311, D312

16 0.8V

1

4002510700 MAIN B'D

P10, P9, P11, P12, P8, P7

C104 0.047(M)

S4 POWER SW

4002510810 POWER SW BD.

S.B0.25A/250V

F101

AC120V/60HZ

UNSWITH

UL, CSA VERSION

6 : WHITE(120V)
5 : YELLOW(100V)
4 : RED (0 V)
3 : BLUE (120V)
2 : ORANGE(100V)
1 : BLACK (0 V)

D101 — D104 : 1N4002
D301 : SLR 54 UR C3
D302 : SLB 15 UR 3RD
D303LR — D309LR : SLR 54 UR3
D310 — D312 : RD 3.3 E B1

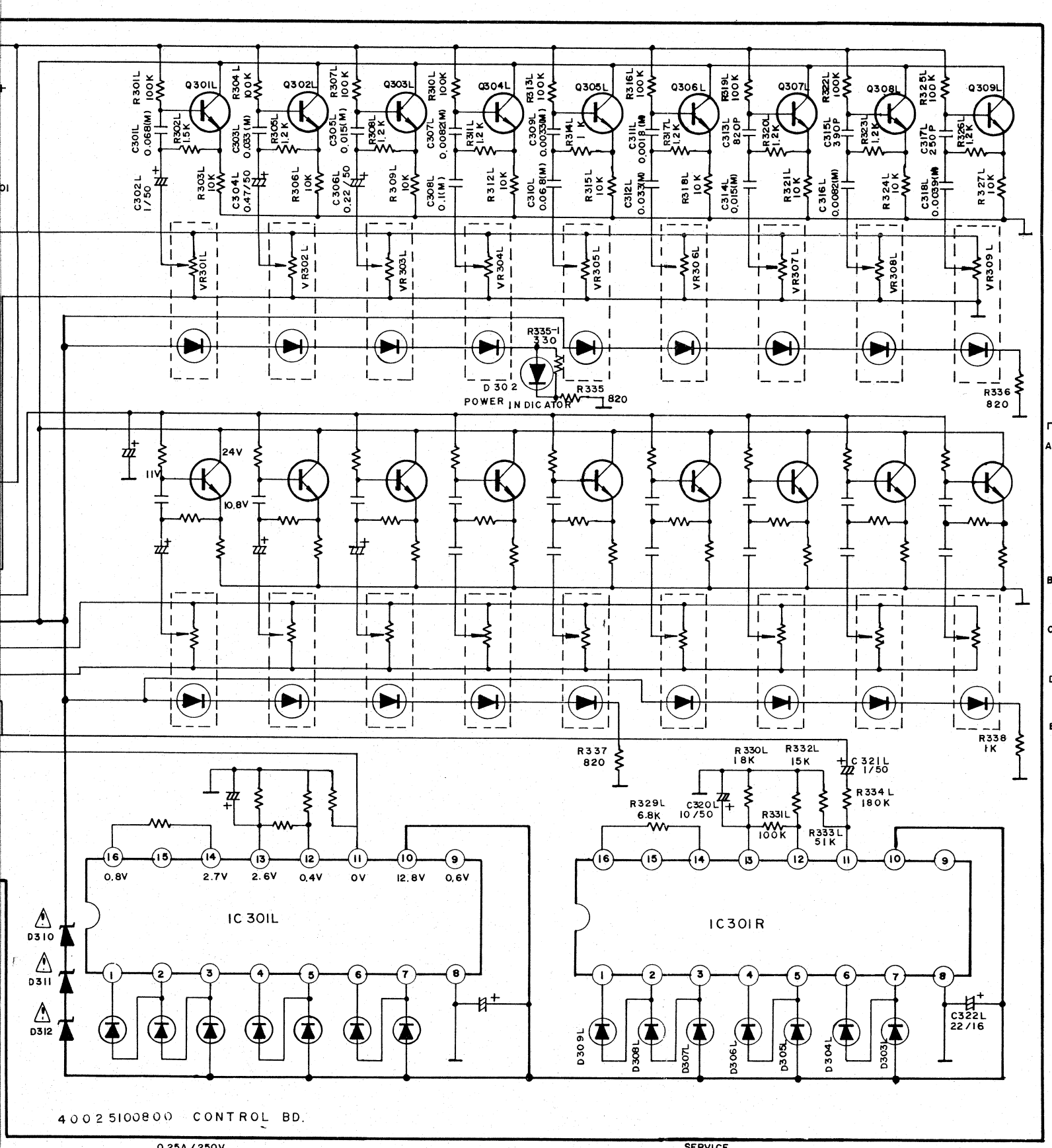
IC101 : 78M24
IC201LR : NJM4560
IC301LR : AN6882

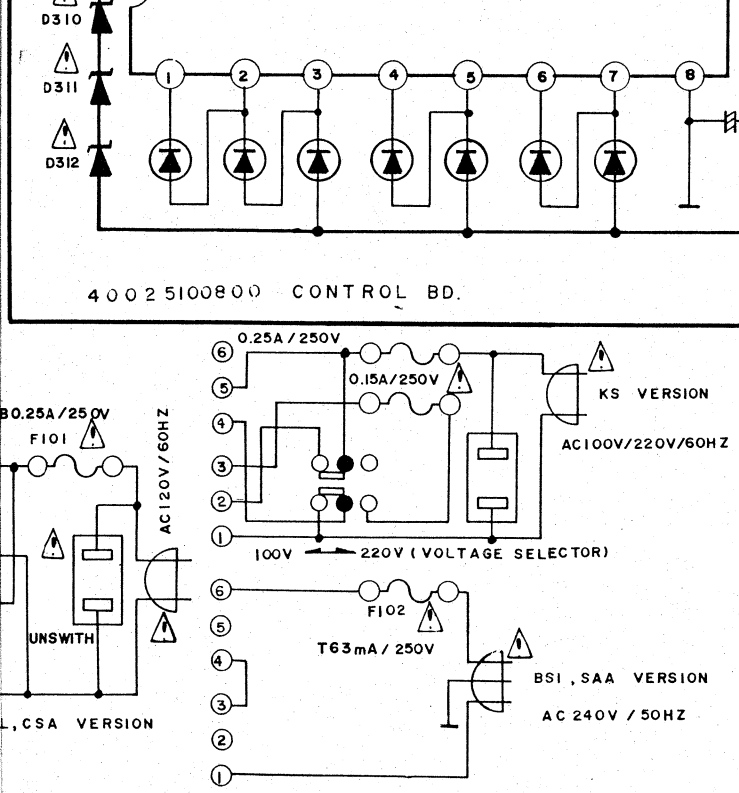
Q101 : KTA1015
Q102L/R: 2SD1302
Q301L/R — Q309L/R : KTC3199
VR301L/R — VR309L/R : 50KOHM — W

A B C D

tic Diagram

EQ460





SERVICE INFORMATION:

1. RESISTANCE VALUES ARE INDICATED IN OHMS UNLESS OTHER-WISE SPECIFIED. (K=1,000, M=1,000,000)
2. CAPACITANCE VALUES ARE SHOWN IN MICROFARADS UNLESS OTHERWISE NOTED. (P=MICRO-MICRAFARADS)
3. COMPONENT VALUES ARE SUBJECT TO CHANGE WITHOUT NOTICES.
4. ALL VOLTAGES ARE REFERENCED TO GROUND UNDER THE FOLLOWING CONDITIONS
   - D.C. SIGNAL EXCEPT WHERE INDICATED.
5. THE ⚠ MARK FOUND ON SOME COMPONENT PARTS INDICATES THE IMPORTANCE OF THE SAFETY FACTOR OF THE PART, THEREFORE WHEN REPLACING, BE SURE TO USE PARTS OF IDENTICAL DESIGNATION.

※ THE ⏦ MARKED RESISTORS ARE MOUNTED ABOVE THE P.C.B ON SLEEVES.

「PRECAUTIONS」

A) ALL REPLACEMENT COMPONENTS IDENTIFIED BY ⚠ MUST BE REPLACED ONLY WITH ORIGINAL TYPE SPECIFIED BY THE MANUFACTURER. AND INSTALLED AS THE ORIGINAL, WITH SPACERS AND POSITIONED AWAY FROM ADJACENT COMPONENTS WHERE APPLICABLE.

B) ALL SOLDERING MUST BE DONE IN A PREFESSIONAL MANNER USING SOLDER WITH RESIN CORE ONLY.

C) ALL COVERS, SHIELDS AND INSULATING SPACERS MUST BE REPLACED BEFORE RETURNING APPLIANCE TO CUSTOMER.

D) A DAMAGED POWER SUPPLY CORD MUST BE REPLACED BEFORE RETURNING APPLIANCE TO CUSTOMER.

E) A DIELECTRIC TEST CONSISTING OF 1080V AC 60HZ IS TO BE APPLIED BETWEEN BOTH BLADES OF THE POWER SUPPLY CORD ATTACHMENT PLUG AND THE EXFOSED CONDUCTIVE SURFACE OF THE APPLIANCE FOR A PERIOD OF NOT LESS THAN ONE SECOND BEFORE RETURNING APPLIANCE TO CUSTOMER.